

AMENDMENTS TO THE DRAWING

The attached sheet of drawing includes changes to FIG. 5 and FIG. 6 . This sheet which includes FIGs 4, 5, and 6. replaces the original sheet including the same drawing figures.

In Fig. 5, the polygon shape of the elongate thermally conductive member 101 is more clearly shown. In Fig. 6, surface 107 is correctly identified, extraneous lines are removed, and conductive leads to LED 109 are more clearly shown with common cross-hatching.

No new matter has been added and support for each change is found in the specification.

REMARKS/ARGUMENTS

At the outset, it is pointed out to the Examiner that the office action is now the fourth office action issued by this Examiner in this case.

The claims have not substantively changed over those originally filed.

Applicant, respectfully, but most strongly objects, to the Examiner's piecemeal prosecution of this application.

The Examiner's attention is directed to M.P.E.P. 707 **Completeness And Clarity Of Examiner's Action**, which quotes form 37 C.F.R. 1.104 directed to the "Nature of Examination." In clear and unambiguous language, it is stated:

"The examiner's action will be complete as to all matters..."

The Examiner's attention is also directed to M.P.E.P. 707.07(g) **Piecemeal Prosecution**.

"Piecemeal prosecution should be avoided as much as possible. The Examiner ordinarily should reject each claim on all valid grounds available..."

In addition, contrary to the Examiner's gratuitous statement at numbered paragraph 3 of the Office Action that he is "not necessarily persuaded by Applicant's arguments," the withdrawal of the prior rejection is an express acknowledgement by the Examiner of the persuasiveness of the traversal of the prior rejections. (M.P.E.P 707.07(f)).

STATUS OF APPLICATION

Claims 1-63 are in the application as filed.

Claims 1-63 stand rejected.

1. Claims 1-5, 9-11, 14, 17, 22-26, 30-32, 35, 38, 41, 43-47, 51-53, 56, 59, and 62 stand "rejected under 35 U.S.C. 102(b) as anticipated by over U.S. Patent 6,848,819 ('819)."

2. Claims 6-8, 12, 13, 18, 19, 27-29, 33, 34, 39, 40, 48-50, 54, 55, 60 and 61 stand "rejected under 35 U.S.C. 103(a) over the '819 patent.

3. Claims 15-16, 21, 36-37, 42, 57-58, and 63 stand "rejected under 35 U.S.C. 103 (a) as being unpatentable over the '819 patent in view of the U.S. Patent 6,517,218 ('218).

Objection to the Specification

The Examiner objects to the disclosure because paragraph [0029] is not terminated. The specification has been amended to correct this error.

Objection to the Drawing

The Examiner objects to the drawing for failing to show “connector 113” as described in paragraph [0030]. Paragraph [0030] has been amended to correct the typographical error. This objection to the drawing is thereby traversed.

The Examiner at paragraph 6 of the Office action objects to the drawing as not showing the following features: “extrusion”, “protrusions”, “polygon” and “triangular.”

With respect to “extrusion”, paragraph [0027] describes elongate heat sink 101 as “a tubular aluminum extrusion.” Accordingly the “extrusion” of claims 9, 10, 30, 31, 51, and 52 is shown in the drawing figures since elongate heat sink 101 is shown therein, and the objection to the drawings based thereon is traversed.

With respect to “protrusions,” paragraph [0027] has been amended to indicate that element 105 are fins or “protrusions.” Accordingly the “protrusions” of claims 4, 25, and 46 are shown in the drawings and the objection to the drawings based thereon is traversed.

With respect to “polygon,” paragraph [0031] states that “tubular heat sink 101...is formed in the shape of a polygon...” FIG. 5 has been corrected to more clearly show the polygon nature of the tubular heat sink. It is submitted that such a correction is not necessary because it is apparent from the other views of the tubular heat sink 101 that it has flat surfaces and it of necessity a polygon. However, to advance prosecution of the application, the drawing has been amended. The objection relative to claims 6, 12, 27, 33, 48, and 54 is thereby traversed.

With respect to “triangular” it is respectfully submitted that it is unnecessary to show every variation that is claimed in the drawing figures. However to advance prosecution of the application claims 13, 24, and 55 are cancelled. Applicant reserves the right to reinstate claims 13, 24 and 55 in this or a continuation application since support for the triangular cross section is found in the application as filed.

In addition, in reviewing the drawing FIG. 6, it became apparent that the connector line from designator 107 to the appropriate surface was not correctly placed. That has been corrected. In addition, the lines across LED 109 have been removed. The electrical connections between LED 109 and the conductive paths 129 are also now more clearly shown. Support for the changes to FIG. 6 may be found in paragraph [0029].

The ‘819 Patent

The Examiner relies upon the ‘819 patent as the primary reference for rejecting all claims in the application.

It is respectfully submitted that the '819 patent does not anticipate or make obvious the novel structures of Applicant's invention as claimed.

The '819 patent teaches away from Applicant's novel structures.

The '819 patent is directed to the dissipation of heat away from a printed circuit board and relies upon heat conduction through the printed circuit board from the copper bonding pads for the LEDs to a metal layer plated on the bottom of the pc board and then to a heat sink.

The specific problem to which the '819 patent is set out beginning at col. 1, line 60. The '819 patent teaches that heat from a LED chip is eliminated via the electrical terminal of the LED. Depending on the LED structure to which the teachings of '819 is addressed, the heat is conducted by the electrical onto solder points that are on copper solder pads on a printed circuit board. "From the solder points, the heat at first propagates in the copper pads and then on the epoxy resin material in the plane of the printed circuit board. Subsequently, the heat is output large-area to the environment by thermal radiation and thermal conduction." (col 2, lines 2-7)

The '819 patent continues on to state that the thermal resistance for one LED on a pc board is relatively slight, but becomes significant when many LEDs are "arranged in close proximity on a circuit board." (Col 2, lines 11-12). This is explained in the '819 patent as a result of a "smaller percentual area of the PCB is now available for each individual LED for heat transmission to the environment."

"An object of the ('819) invention is to specify a surface-mounted LED arrangement that is distinguished by an improved heat elimination from the LEDs." (Col. 2, lines, 37-39)

The structures of the '819 patent are each a printed circuit board having surface mounted LEDs on one side of the circuit board, the side of the board opposite the LEDs has a metallic layer that is electrically insulated from the LEDs by the circuit board. The metal surface is applied to a cooling member. The cooling member is copper or aluminum or a cooling plate. The cooling member is secured to the circuit board by thermally conductive adhesive. (Col. 2, lines 44-62)

The printed circuit board is of plastic material that conducts heat poorly. (Col. 2, lines 63-65)

The copper pads on the circuit board "should be as large as possible in order to broaden the heat path through the printed circuit board material. (Col. 3, lines 6-9).

It is clearly apparent that the teachings of the '819 patent are directed to and limited to a structure in which a circuit board carries the LEDs. The LEDs are soldered to metal pads on the same surface of the circuit board. Heat is transferred from the pads, through the circuit board to a metal surface on the other surface of the circuit board, through an adhesive layer to a cooling member.

Thus, the structures of the '819 patent require that the LEDs are carried on copper solder pads on one surface of a circuit board and heat transfer is via solder pads through the circuit board to a metallization layer on the opposite surface of the circuit board and then to the cooling member via an adhesive layer.

The LEDs are not carried by the cooling member.

The '819 patent shows and teaches structures that are fundamentally different from Applicant's claimed invention.

More specifically, the structures shown and described in the '819 patent all utilize surface mount LEDs. The LEDs are mounted to and carried on one surface of a thermally and electrically insulating printed circuit board. More specifically, the printed circuit board is a plastic material. A cooling member is provided on the other surface of the PC board. The printed circuit other surface is secured to the cooling member.

PRESENTED PREFERRED EMBODIMENTS

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The embodiment of the present invention shown in FIG. 1A contains a printed circuit board 1 on which a plurality of preferably surface-mounted LEDs 2 are applied. In a known way, the printed circuit board 1 thereby forms a circuit that comprises terminal surfaces for the mounting of the LEDs at defined locations. These terminal surfaces are provided, for example, with lands for soldering in an automatic surface mount device (SMD) equipping unit, and the LEDs 2 have their electrical contacts 2a soldered to these terminal surfaces in a subsequent mounting step.

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The printed circuit board 1 can be a rigid printed circuit board, such as type FR4, and constructed of an epoxy resin

It is clearly evident that the printed circuit board is plastic or epoxy and is not a thermal conductor. This is explicitly stated at col. 3, lines 1-5

flexible plastic. For example, it can be composed of polyester or polyamide film, or it may comprise what is often referred to as flex-board. Flex board is generally multi-layer printed circuit boards that are uniformly constructed of a plurality of polyamide carrier films.

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The relevant structure of the devices of the '819 patent are clearly set out in claim 1 of the '819 patent:

1. A surface-mounted LED arrangement, comprising:
 - a printed circuit board having a principal surface and a secondary surface, said printed circuit board comprising a plastic material, 20
 - a plurality of LEDs arranged on said principal surface,
 - a metallic layer provided on said secondary surface that is electrically insulated from said plurality of LEDs,
 - a cooling member connected to said secondary surface, 25
 - wherein said printed circuit board is secured to said cooling member with at least one of a thermally conductive paste, a thermally conductive adhesive and a thermally conductive film, and

35 USC 102 REJECTION

Claim 1, recites, inter alia: A light source comprising: an elongate thermally conductive member having an outer surface; at least one solid state light source carried on said elongate member outer surface...”;

Claim 2, recites, inter alia: A light source comprising: an elongate thermally conductive member having an outer surface; a plurality of solid state light sources carried on said elongate member outer surface...”;

Claim 22, recites, inter alia: A radiation emitting source comprising: an elongate thermally conductive member having an outer surface; at least one radiation emitting semiconductor device carried on said elongate member outer surface;

Claim 23, recites, inter alia: A radiation emitting source comprising: an elongate thermally conductive member having an outer surface; a plurality of radiation emitting semiconductor devices carried on said elongate member outer surface...”;

Claim 43, recites, inter alia: A radiation emitting source comprising: an elongate thermally conductive member having an outer surface; at least one radiation emitting solid state device carried on said elongate member outer surface...”;

Claim 44, recites, inter alia: A radiation emitting source comprising: an elongate thermally conductive member having an outer surface; a plurality of radiation emitting solid state devices carried on said elongate member outer surface...”;

Although the Examiner has not pointed with specificity the basis for his rejection of claims 2, 22, 23, 43, and 44, Applicant provides the following comments that clearly traverse any rejection of claim 1 and those claims based on the '819 patent.

Standard for anticipation

The standard for anticipation under 35 U.S.C. 102 is set forth in M.P.E.P. 2131:

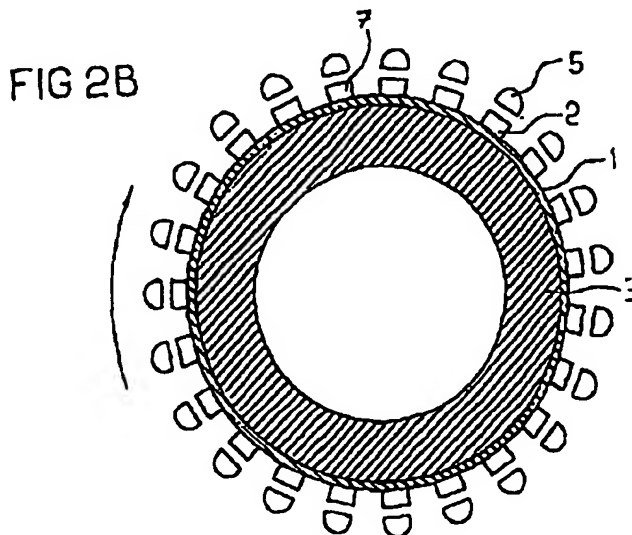
'A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described in a single prior art reference.' *Verdegal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631... 'The identical invention must be shown in as complete detail as is contained in the claim.' *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913,1920 (Fed. Cir. 1989)....

For anticipation under 35 USC 102, the reference must teach every aspect of the claimed invention either explicitly or implicitly. Any feature not directly taught must be inherently present.

As will be specifically pointed out below, the Examiner has failed to follow this clear directive for determining anticipation.

Application of the standard for anticipation

The Examiner points to the specific embodiment of FIG. 2B and what he identifies as "3/1" as being the elongate thermally conductive member.



First, the structure of FIG. 2B is not an elongate structure.

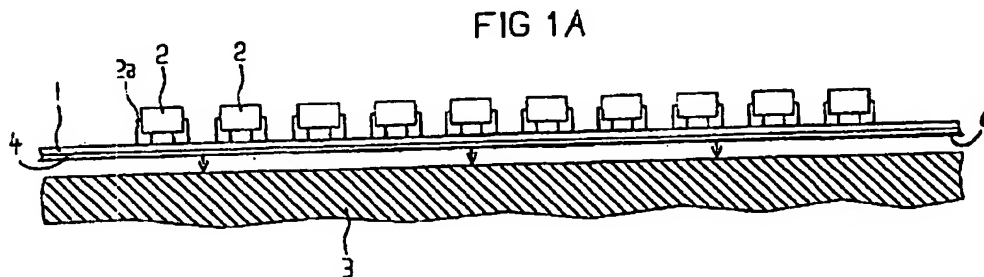
The American Heritage® Dictionary defines elongate:

elongate (adj.) Made longer; extended.

elongate (adj.) Having more length than width; slender.

FIG. 2B does not show an elongate structure. The description of FIG. 2B fails to describe any structure that is clearly elongate. Similarly none of the drawings 1A, 2A, 2B, 2D show elongate members since they are all cross sections and as such show only at best a portion of one of the length or width of the member 3. FIG. 1B shows the only PC board 1 in its entirety and the structure is square not elongate. The squareness of the structure of FIG. 1B is easily determined by measuring the length and width of the structure. Little can be determined from the drawing of FIG. 2C since neither the drawing or description shows the cooling member or members 3.

In addition, the Examiner mischaracterizes the structure of FIG. 2B. The plain teachings of the reference clearly describe "3/1" as two separate elements and not as a unitary structure. The arrangement of "3/1" is shown and described more clearly in the alternate embodiment of FIG.1A.



It is clear from the descriptions of the structures of FIG.1A and 2B that **element 1 in all drawings is a plastic or epoxy electrically insulating and thermally insulating printed circuit board.** Element 3 is a thermally conductive member to which printed circuit board 1 is attached with an adhesive layer 6. Layer 4 is a metal layer on the back side of the printed circuit board 1.

It is clear from the drawings that the thermally conductive member 3 does not carry its LEDs 2 on its outer surface. **Rather, the thermally non-conductive printed circuit board 1 carries the LEDs 2.** The Examiner's attention is again directed to the reproduced portions of the reference above which clearly state that the LEDs are carried on the printed circuit board 1 and not on the structure 3.

It is clear from a plain reading of the descriptions of the structures in the '819 patent that the printed circuit board 1 carries LEDs 2 on one surface and carries the heat sink 3 on its opposite surface.

In other words, **the '819 patent teaches away from the novel structures of applicant's claimed invention** which set forth structure in which the LEDs, solid state light sources, radiation emitting semiconductor devices, and radiation emitting solid state devices are carried on the elongate thermally conductive member.

The Examiner has not met the standards for anticipation under 35 USC 102 of:

‘A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described in a single prior art reference.’ or

‘The identical invention must be shown in as complete detail as is contained in the claim.’

The Examiner is not permitted to change the teachings of a reference in order to meet the structure claimed by an applicant.

No elongate thermally conductive member having an outer surface carrying LED's is shown, taught or suggested in the '819 patent.

On this basis alone, claims 1, 2, 22, 23, 43, and 44 are not anticipated by the structures shown and taught in the '819 patent.

All of the claims in the application depend from base claims 1, 2, 22, 23, 43, and 44. For the same reasons that the base claims are not shown, taught or made obvious by the '819 patent, these claims that add additional limitations are not shown, taught or made obvious by the '819 patent.

In addition, the Examiner in his rejection of claims 14, 35, and 56 at page 9 states that:

“the reference further discloses that said elongate thermally conductive member comprises a flexible circuit (flexible printed circuit board 1, col. 4, lines 1-5) carried on a surface of said elongate thermally conductive member...”

The Examiner, for purposes of rejection of the base claims takes the unfounded position that the elongate thermally conductive member is arrangement “3/1”, but then the Examiner takes the inconsistent position that the “arrangement” is actually a flexible circuit and an elongate thermally conductive member. The position taken with respect to claims 14, 35 and 9 is inconsistent with the position the Examiner takes with respect to the base claims.

The “elongate thermally conductive member” that the Examiner points to is not a member, but is a multimember structure comprising layers of a printed circuit board 1, and adhesive layer, and a thermally conductive member 3. In addition, by the express language of the '819 patent, the printed circuit board is thermally insulating, not thermally conducting.

In short, the structure 3/1 is not elongate. The structure 3/1 is not thermally conductive. The structure 3/1 is not a “member.”

It is respectfully submitted that the Examiner's analysis is fundamentally flawed.

Based on the foregoing, none of claims Claims 1-5, 9-11, 14, 17, 22-26, 30-32, 35, 38, 41, 43-47, 51-53, 56, 59, and 62 are not anticipated, shown, taught or made obvious by the '819 patent.

35 USC 103 rejection over '819

The Examiner's rejection of claims 6-8, 12, 13, 18, 19, 27-29, 33, 34, 39, 40, 48-50, 54, 55, 60 and 61 under 35 U.S.C. 103(a) over the '819 patent is respectfully traversed.

Each of the claims rejected depends from one of base claims 1, 2, 22, 23, 43, and 44. For the same reasons that these base claims are not anticipated, shown, taught or made obvious by the '819 patent, claims 1, 2, 22, 23, 43, and 44 are not shown, taught or made obvious by the '819 patent.

In addition, the Examiner again mischaracterizes the teachings of the '819 patent where he states:

"The reference further discloses ... said elongate thermally conductive member comprises a tube..."

The reference fails to disclose that the tubular construction of the member 3 is elongate as pointed out above.

In addition, the '819 patent teaches away from the present invention since it teaches the use of an intermediate insulating printed circuit board between the LEDs and the heat sink.

For these additional reasons, claims 6-8, 12, 13, 18, 19, 27-29, 33, 34, 39, 40, 48-50, 54, 55, 60 and 61 are not shown, taught or made obvious by the '819 patent.

With respect to claims 7, 28, and 49 the Examiner bases his rejection not on the teachings or disclosure of the '819 reference, but upon sheer speculation that is unfounded by stating:

"said tubular thermally conductive member...should have a cross-section having flat portions."

Since the Examiner is providing opinion without any factual basis, the Examiner is expressly requested to provide the factual basis and explicit evidence in support of the opinion. It is respectfully submitted that the Examiner's unsubstantiated opinion is not a proper basis for rejection.

On this additional basis, the rejection of claims 7, 28 and 49 is traversed.

Similarly, with respect to claims 8, 18, 29, 39, 50, and 60, the Examiner states

"Although the reference does not disclose that said elongate thermally conductive member comprises a flow channel for said thermal transfer media, it would appear that said cooling ribs should form a channel so as to facilitate said

flowing of said thermal transfer media.”

Since the Examiner is again providing opinion without any factual basis, the Examiner is expressly requested to provide the factual basis and explicit evidence in support of the opinion. It is respectfully submitted that the Examiner's unsubstantiated opinion is not a proper basis for rejection.

On this additional basis, the rejection of claims 8, 18, 29, 39, 50 and 60 is traversed.

Still further, the Examiner's rejection of claims 19, 40 and 61 is traversed,

The Examiner, in rejecting these claims states:

“However, the reference does not disclose using a clip...as claimed.”

The Examiner then states that “various securing devices were just different configurations one of ordinary skill in the art would find obvious for mounting or securing said elongate thermally conductive member into said fixture, and therefore such selecting of securing devices would have been obvious to one of ordinary skill in the art...”

It is respectfully submitted that the Examiner has failed to follow the factual inquiries set forth in *Graham v John Deere*.

“The factual inquiries set forth in *Graham v. John Deere Co.*, 148 USPQ 459, that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or unobviousness.”

1. It is inherent in these inquiries that the Examiner must have an evidentiary basis for the determinations made. The Examiner must consider each piece of prior art for what it fairly teaches within its four corners.

2. The Examiner provides inconsistent determinations between the teachings of the references and the rejections of the various claims. The totally inconsistent positions are a complete failure to ascertain the differences between the prior art and the claims.

In other aspects, the Examiner acknowledges the failure of the references to show or disclose significant aspects of the claimed invention. However, *the Examiner without pointing to any reference and without providing any evidentiary affidavit makes pronouncements as to what is old and well known in the art.*

This is a complete failure to properly determine the differences between the prior art and the invention as claimed.

3. The Examiner makes no effort to resolve the level of skill of one skilled in the lighting arts.

For the reasons set forth above, claims 6-8, 12, 13, 18, 19, 27-29, 33, 34, 39, 40, 48-50, 54, 55, 60 and 61 are not shown, taught or made obvious by the '819 patent.

35 USC 103 rejection based on '819 and '218

The Examiner's rejection of claims 15-16, 21, 36-37, 42, 57-58, and 63 over the '819 patent and '218 patent is respectfully traversed.

Each of the rejected claims depends from one of the base claims that is not shown, taught or made obvious by the '819 patent and adds further limitations and structure. The '819 patent is pointed to by the Examiner as showing providing apertures in pc boards so that the LEDs can be in contact with an elongate thermally conductive member.

For the same reasons set forth above that the base claims are not shown, taught or made obvious by the '819 patent, claims 15-16, 21, 36-37, 42, 57-58, and 63 are not shown, taught or made obvious by the '819 patent in combination with the '218 patent.

The '218 patent is directed to a structure in which each LED 12 is in direct contact with an LED specific heat sink 18 that is affixed to the bottom of the LED and to electrical lead 14. The heat sink 18 includes an extension 25. Extension 25 is then surrounded by an electrical insulator 28 that conducts heat to a large heat dissipater 30. Heat sink 18 is not carried on the outer surface of heat dissipater 30, but rather is carried in a blind bore in heat dissipater 30. Just as the LEDs of the ski pole patent previously cited by the Examiner were not carried on an outside surface of the ski pole, LED 12 is not carried on the outer surface of heat dissipater 30, but rather is carried in a bore in heat dissipater 30.

In contrast, the LEDs utilized in the '819 patent are electrically and thermally insulated from the heat dissipater 3.

The Examiner fails to note that the LED device of the '218 patent is significantly different from that of the '819 patent. The Examiner also fails to note that the LED 12 is not merely inserted through an aperture in a printed circuit board, but LED 12 of the '218 patent utilizes and intermediate heat sink 18 that is affixed to the bottom of LED 12.

The LEDs utilized in the '218 patent are significantly, structurally different from those of the '819 patent. It is not seen how one skilled in the art would have been motivated to change the types of LEDs utilized in the '819 patent and change the pc board to include apertures. To do what the Examiner has proposed fundamentally changes the principle of operation of the '819 patent.

MPEP 2143.01 provides the guidance that the proposed modification of the prior art cannot change the principle of operation of the prior art reference.

For this additional reason, the structures of claims 15-16, 21, 36-37, 42, 57-58, and 63 are not shown, taught or made obvious by the combined teachings of the '819 patent and the '218 patent.

It is respectfully submitted that the Examiner pay attention to the examination standards for determination of obviousness. The Examiner's attention is drawn, in particular, to MPEP 706.02(j) and MPEP 2143 and the three basic criteria that must be set out to establish a prima facie case of obviousness.

The first criteria is that **"there must be some suggestion of motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings."**

"Second, there must be a reasonable expectation of success."

"Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success **must both be found in the prior art and not based on applicants disclosure.**" MPEP 2143 quoting *In re Vaeck*

MPEP 706.02(j) quotes *Ex Parte Clapp*: "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention, or the Examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to be obvious in light of the teachings of the references."

The '819 patent and the '218 patent teach structurally different approaches utilizing LED components that are not interchangeable. There is no reasonable basis for modifying the structure of the '819 patent as suggested by the Examiner. Even assuming one were to modify the structure of the '819 patent in view of the '218 patent, the resulting structure would not teach or suggest the limitations in the claims.

It is respectfully submitted that the Examiner has not followed the examination standards for determination of obviousness.

CONCLUSION

It is respectfully submitted that none of the claims presently in the application are shown, taught or made obvious by any of the references cited taken singly or in any combination.

Reexamination and reconsideration are requested. It is further requested that the claims be allowed and the application be passed to issue. It would be appreciated to receive an early notice of allowance.

Should there be any issues that may be resolved telephonically, the Examiner is invited to call the undersigned at 602-463-2010.

Respectfully submitted,

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August 19, 2006

CERTIFICATE OF MAILING

I hereby certify that this document (and any as referred to as being attached or enclosed) is being transmitted by EXPRESS MAIL SERIAL NO. **ER156299019US** on **August 19,2006** addressed to Commissioner for Patents, PO BOX 1450, Alexandria, VA 22313-1450.

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/Donald J Lenkszus/

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